

£100,000 OF FILM AND GEAR WAITING TO BE CLAIMED INSIDE →

OCTOBER 2004 £3.20

PRACTICAL Photography

PASSIONATE ABOUT PICTURES

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Take better
**BLACK
& WHITE**

How to frame life's special moments in classic mono



Film scanners

Reviews you can
TRUST



Plustek OpticFilm 7200



Konica Minolta DiMAGE Dual Scan 4



HP Scanjet 8200



Canon Canoscan FS4000US

how to be a smarter buyer: film scanners

Whether archiving all your film images or keen to get into digital imaging without having to buy a new camera, for high quality results you'll need the best scanner that you can afford. Here we test eight models that offer resolutions good enough for photo quality prints up to either A4 or A3 sizes from your 35mm negatives and slides. Find out how they compare and which offers the best results for your money in our comprehensive film scanner test.

Turn the page to start our comprehensive guide to film scanners



£272

Canon Canoscan 9900F



£335

Epson Perfection 4870 Photo



£469

Nikon Coolscan LS50ED



£527

Konica Minolta DiMAGE Scan Elite 5400

How we did the test

Each of the scanners was connected via a USB connection to a 2.8GHz Pentium 4 computer with 512Mb RAM and running Windows XP. Timings were taken for preview times and scanning mounted slides at the highest optical resolution, with and without any dust removal systems activated.

Further timings were taken with any other image enhancement options activated such as sharpening, colour restoration and grain removal. A standard slide was used throughout all these timings. Further frames were scanned including high contrast, and over/underexposed images to see how the scanners coped with a variety of originals.

Dust, fingerprints and scratches were added to a slide which was scanned with any dust/scratch removal systems enabled to see how successful these were at removing damage. The images were printed at A4 and A3 on an Epson Stylus Photo 1290S.

How we scored it

We give star ratings from one to five for each area of the test. For a scanner to score five stars it must offer outstanding performance for a particular criterion. The overall scores are given on the whole performance throughout the test.

Epson Perfection 4870: With a wide range of film adapters supplied as standard the Epson 4870 is a superb option for those with several different film formats to scan.



Joining the digital age doesn't have to mean throwing away all your favourite film cameras, as buying a high quality film scanner will allow you to make digital files of your images. And even if you've gone for a digital camera, you've probably got loads of images that would benefit from the archiving and image adjustments available to digital imaging.

We've taken eight scanners that all offer at least 3200dpi resolution – including both dedicated film scanners and hybrid models – but it's their ability to scan 35mm film that we'll be concentrating on.

Out of the box

There's nothing worse than getting your new equipment home only to find that you need extra bits to get it up and running, so it's great to find that all eight machines here are supplied complete with all leads to connect at least to the common USB interface. They're also all ready for mounted slide or film strips without the need for any additional expensive accessories too.

The Nikon is the only film scanner not to come supplied with a film strip and mounted slide holder as standard. It will take both types of film as supplied, but mounted slides must be fed in individually and the SA-21 strip film adapter feeds in the film automatically.

There are a host of film adapters supplied with the hybrid models, from 35mm right up to 5x4in sheet film. The Epson has the most comprehensive range with separate units for the various formats, closely followed by the Canon 9900F.

Out of the box ratings

Plustek OptiFilm 7200	★★★★
Konica Minolta DiMAGE Dual Scan 4	★★★★★
Canon CanoScan 9900F	★★★★★
Epson Perfection 4870 Photo	★★★★★
HP Scanjet 8200	★★★★★
Canon CanoScan FS4000US	★★★★
Nikon Coolscan LS50ED	★★★★
Konica Minolta DiMAGE Scan Elite 5400	★★★★★

Installation

It pays to read any instructions included before you start installing any hardware onto your computer. All eight models came with a simple, easy to follow set-up guide and loaded onto a Windows XP machine without any drama.

The Plustek comes with two CDs – one for the drivers and associated software, and another with the additional Silverfast scanning software. This makes the installation slower than a single integrated CD, as you have to restart the machine once the standard software is installed, and then install Silverfast.

The other machines come with all the driver software on a single CD, with only any additional image manipulation – such as Photoshop Elements – on a separate disc.

Installation ratings

Plustek OptiFilm 7200	★★★★
Konica Minolta DiMAGE Dual Scan 4	★★★★★
Canon CanoScan 9900F	★★★★★
Epson Perfection 4870 Photo	★★★★★
HP Scanjet 8200	★★★★★
Canon CanoScan FS4000US	★★★★
Nikon Coolscan LS50ED	★★★★
Konica Minolta DiMAGE Scan Elite 5400	★★★★★

Build quality

With the hybrid models the quality of the lid will either inspire confidence or make you wary of breaking it every time you replace your film or prints. The Canon has the most robust feel of the three models here, with a positive action. The brushed metal top adds some weight to the lid too. The Epson feels substantial, but the lid doesn't lock when you raise it, while the HP offers a flimsy, lightweight operation.

Of the film scanners the DiMAGE Scan Dual and the Plustek both feel insubstantial next to the more expensive models. The simple push-in film holder on the Plustek lacks the more sophisticated

What are the differences?

Dedicated film scanner



Light and sensor

Located inside the machine, the light source and associated optics in a film scanner are protected from damage and dust. A film scanner can only record transmitted light as the light source is placed the opposite side of the subject to the sensor.

Film slot

Film has to be inserted into the scanner through this slot. Some models take film or mounted slides directly, while others use a film holder to insert film strips or mounted slides into the machine. For scanning multiple slides a holder means less chopping and changing.

Hybrid scanner

Light lid

For scanning prints or artwork the light source is below the platen. For film scanning there is an additional light source located in the lid of the scanner to shine light through the film.

Platen

This glass area is normally used to place your prints. For best results this must be kept perfectly clean and dust-free to ensure high quality scans. With a hybrid scanner film is either placed in holders on the platen or in a dedicated film holder in the lid of the scanner.

Quick function buttons

Most flatbed and hybrid scanners feature a number of buttons to automate jobs such as scan to web, copy and fax. These are primarily for scanning prints or paper rather than film originals. There's also a button to launch the scanner software so you don't have to find it on-screen.



Resolution

It would be easy to think that you always need massively high resolutions for all images. While it is true that higher resolution images produce smoother results they also come at a cost. Higher resolution images take longer to scan and edit and take up much more disk space. Choosing the resolution is often a case of experimenting and then remembering your settings.

It is advisable to decide upon the purpose of the scan and let that determine the resolution rather than just scanning at maximum resolution every time. For example, if you wanted to scan your pictures to print at A4 size you would require a resolution of around 2400 pixels, whereas if you wanted to print at A3 you would need 3600 pixels. Once an image is scanned, the only way to increase the resolution is to scan the image again.

Resolution is just one of the many factors regarding image quality. Scanner manufacturers will often claim an extraordinarily high resolution for their products. Make sure that this is the optical resolution – exactly the number of pixels that the scanner can see – and not the interpolated resolution – when software adds new pixels by calculations. The optical resolution is the better guide to the actual quality of the scanner.

Lack of sharpness in an image is also dependant on the quality of the optics and how the software processes the information. It is wise to decide how large you will need images to be before you decide which scanner to buy, as you may end up wasting money for those extra pixels that you don't need.

motorised transport that's even offered by the slightly more expensive Konica Minolta.

The more expensive Canon and Konica Minolta models both feel solid and well-made, with the metal front panel of the Konica Minolta just having the edge. In comparison the casing of the Nikon feels less substantial, although the rest of the machine is well-built.

Build quality ratings

Piustek OptiFilm 7200	★★★★
Konica Minolta DiMAGE Dual Scan 4	★★★★
Canon CanoScan 9900F	★★★★
Epson Perfection 4870 Photo	★★★★
HP Scanjet 8200	★★★
Canon CanoScan FS4000US	★★★★★
Nikon Coolscan LS50ED	★★★★★
Konica Minolta DiMAGE Scan Elite 5400	★★★★★

Software interface

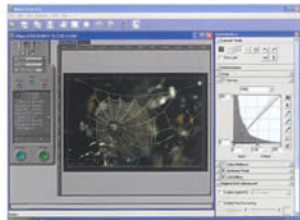
The software interface is your link to the scanner, and should give you all the options in a clear and easy to follow layout.

Despite being the cheapest model here, the Piustek comes with the comprehensive Silverfast software. It's complicated for the first-time scanner user, but offers excellent control for such a bargain price.

Both Konica Minolta machines use the same basic interface, with a single main window. The image adjustment windows have separate tabs, which are easy to use, but after the initial preview scan it can take time while the image is refreshed when you switch between adjustment modes.

All of the hybrid models are geared towards ease of use for flatbed scanning, while for film scanning the Canon and Epson models offer the best range of advanced controls. The HP is user-friendly for simple tasks, but there's a lack of control for fine-tuning your scans.

It's the Nikon Scan 4 software that's the best designed for most levels of users. The basic controls are housed in a panel on the



Nikon Coolscan LS50ED: The Nikon Software is clear, uncluttered and comprehensive.



HP Scanjet 8200: The HP scanner couldn't cope with the tonal range of this high contrast slide.



Canon CanoScan FS4000US: The scans from the Canon are sharp and detailed.

left of the preview window and all of the advanced options are accessed in drop-down windows. It's an excellent set-up and image adjustments are previewed quickly.

Software interface ratings

Piustek OptiFilm 7200	★★★★★
Konica Minolta DiMAGE Dual Scan 4	★★★★★
Canon CanoScan 9900F	★★★★
Epson Perfection 4870 Photo	★★★★
HP Scanjet 8200	★★★
Canon CanoScan FS4000US	★★★★★
Nikon Coolscan LS50ED	★★★★★
Konica Minolta DiMAGE Scan Elite 5400	★★★★★

Scan speed

For individual scans speed may not be critical, but start digitizing your entire back catalogue and a few seconds saved with each scan will really start to add up.

If you can live with the 3200dpi resolution it's the DiMAGE Dual Scan 4 that wins the sprint on a standard scan. The 10-second preview and 30-second scan times are remarkable for the price. Even with the dust removal software on, it still takes only 44 seconds to be ready for the next frame.

Of the higher resolution models it's a close fight between the Scan Elite 5400 and Coolscan LS50ED. The Nikon just has the edge on straight scans, but the Konica Minolta makes up a few seconds with its 10-second preview. It also comes with a holder for up to four mounted slides, which can then be batch scanned – a feature sadly lacking on the Nikon. Turn



Nikon Coolscan LS50ED: The Nikon captured the most shadow detail in this shot.



Konica Minolta Dual Scan 4: The scan speeds are very impressive.

on the ICE system though and the Nikon will produce a 4000dpi scan in only 1 minute 30 seconds, compared to the 4 minutes 50 seconds that the 5400dpi Konica Minolta takes. Using the USB 1.1 connection on the Canon FS4000US gives slow scan times. This could be improved by using the faster SCSI connection, but few computers have this as it's less user-friendly than USB or Firewire.

The hybrid models can't compete with the fastest dedicated film models for individual high-res scans. The HP and Canon models both scan a 35mm frame in just over 3 minutes 30 seconds, with the Epson taking a few seconds longer. In use all three machines had long warm-up times when initializing and scanning, resulting in much longer times between scans than the dedicated film scanners.

The Epson and Canon are both supplied with holders that take up to eight mounted slides or four strips of six frames.

Scan speed ratings

Plustek OptiFilm 7200	★★★★
Konica Minolta DIMAGE Dual Scan 4	★★★★★
Canon CanoScan 9900F	★★★
Epson Perfection 4870 Photo	★★★
HP Scanjet 8200	★★★
Canon CanoScan FS4000US	★★
Nikon Coolscan LS50ED	★★★★★
Konica Minolta DIMAGE Scan Elite 5400	★★★★★

Image quality

With resolutions from 3200dpi to 7200dpi these scanners prove that producing high quality scans isn't as simple as going for the highest resolution. The quality of the optics, image processing and sensor all come into play as well.

Producing a hybrid scanner that can produce great results from A4 prints down to 35mm film is a tall order, and despite the similar resolutions none can compete with the best film scanners here. The Epson 4870 is the best of the three hybrid models for 35mm film scanning. The results are good enough to produce A4 prints with ease though. The HP is the disappointment of the group for 35mm film scanning, with the least detail and sharpness despite the high resolution.

Of the dedicated film scanners it's a close battle between the two 4000dpi models and the 5400dpi Konica Minolta. All three are high enough quality to easily produce A3 prints from a full-frame scan. The Nikon and Konica Minolta have the edge

when it comes to reproducing both highlight and shadow detail - making them the best machines here for scanning high contrast emulsions such as Kodak Elite Chrome Extra Colour and Fuji Velvia.

One area where the Konica Minolta disappoints is the focusing. On many occasions you have to either reset the autofocus or switch to manual to get the best out of the machine. The Nikon and Canon both focus on the slide without any intervention from the user.

The two cheaper machines can't compete with these three models but put in a good performance. The 3200dpi Konica Minolta is a fine machine for producing A4 prints, although it struggles when asked to produce larger prints. At 7200dpi the Plustek has the specification to beat any model here, but the scans don't quite match the numbers. They can be used at A3 size and the detail is impressive for the money. The shadow and highlight detail lag behind the better models here, though, and there's more noise visible in areas of even tone that lets it down. It's still an impressive performer for the money though.

Image quality ratings

Plustek OptiFilm 7200	★★★★
Konica Minolta DIMAGE Dual Scan 4	★★★★★
Canon CanoScan 9900F	★★★
Epson Perfection 4870 Photo	★★★★
HP Scanjet 8200	★★
Canon CanoScan FS4000US	★★★★★
Nikon Coolscan LS50ED	★★★★★
Konica Minolta DIMAGE Scan Elite 5400	★★★★★

What's ICE?

Even the perfect shot can be compromised by blemishes on the film, which take a great deal of skill and time to correct. This is where ICE comes in. ICE (Image Correction and Enhancement) works from within your scanner to automatically correct surface blemishes such as fingerprints, dust and scratches.

The dyes used in most colour films are transparent to infrared (IR) light but, thankfully, fingerprints, dust and scratches are visible and this is how ICE manages to identify them. As well as scanning red, green and blue channels (RGB), it also scans an IR 'D' (Damage) channel, so anything that IR picks up is not part of the image. ICE then uses a mask to subtract these blemishes from the image and fills the spaces from the surrounding pixels, causing minimal softness to the image.

ICE is a step forward in high quality scans but it's not perfect and doesn't work with Kodachrome transnics (its dyes are partially visible to IR) or black & white negs (the silver content blocks IR light). The best advice for blemish-free images is still 'handle with care.'

Konica Minolta DIMAGE Scan Elite 5400: The 5400dpi resolution of the Konica Minolta captures every detail in your image, often down to the grain of the film itself.



NO ICE



The scratches among the branches proved a severe test, while the fingerprint and dust in the clearer areas was less of a challenge.

PLUSTEK OPTIC FILM 7200



The dust removal system of the Silverfast software struggled with all the aspects of this damaged image.

KONICA MINOLTA DIMAGE DUAL SCAN 4



The software-based system in the Konica Minolta left plenty of the fingerprint and dust at the top left on the final image.

CANON CANOSCAN 9900F



The FARE system of this Canon hybrid scanner made a good attempt at repairing the damage, but the scan lacked sharpness.

EPSON PERFECTION 4870 PHOTO



Equipped with digital ICE the Epson dealt with most of the dust, but the scratches proved too much for it.

CANON CANOSCAN FS4000US



The most extreme result came from the Canon FARE system. It repaired the damage but lost some of the detail in the branches.

NIKON COOLSCAN LS50ED - FINE



The Fine setting on the Nikon removed more of the dust than the normal setting, with little effect on the scratches.

NIKON COOLSCAN LS50ED - NORMAL



The sophisticated ICE system did well on the finger marks, but the scratches proved too much for it to cope with.

KONICA MINOLTA DIMAGE SCAN ELITE 5400



Much like the ICE system on the Nikon and Epson, the Konica Minolta did okay with the dust but the scratches remained.

Value

It's hard to argue with the Epson 4870 if you need the versatility of multiple film and print scanning options. Its 35mm film scanning is good enough to satisfy most users and for larger formats it's an even more compelling choice. All of this for just over £300 is a bargain too.

Compared to the Epson both the lower resolution Canon and the more expensive HP are poorer value, although if your main needs are for medium-format and print scanning the Canon is a good choice.

For the highest quality film scanning you're better off spending the extra on a dedicated film scanner though. The price of the Canon FS4000US is tempting against the more expensive Nikon and Konica Minolta machines, but the lack of a USB 2.0 connection is a real handicap, making the Canon the slowest of the three machines.

The Konica Minolta is a superb machine, but the software isn't as polished

as the Nikon and the extra resolution makes little difference to the scans, even when they are printed at A3 size.

For those on a budget the Plustek is a good choice, even though the results don't live up to the quoted 7200dpi resolution it produces images to challenge more expensive models. These can be printed larger than any other budget model, but the low dynamic range is disappointing. The Konica Minolta Dual Scan 4 makes the most of it's relatively lowly 3200dpi though, especially for prints smaller than A3 and it offers superb speed.



Value ratings

Plustek OpticFilm 7200	★★★★★
Konica Minolta DIMAGE Dual Scan 4	★★★★
Canon CanoScan 9900F	★★★
Epson Perfection 4870 Photo	★★★★★
HP ScanJet 8200	★★
Canon CanoScan FS4000US	★★★
Nikon Coolscan LS50ED	★★★★
Konica Minolta DIMAGE Scan Elite 5400	★★★

Dust removal

To test the ability of the dust and scratch removal systems available on the scanners we scanned a slide with various levels of damage from simple dust and fingerprints to a deep scratch to see how they dealt with the damage.

The Plustek uses the software-based dust and scratch removal within the Silverfast driver. Both Canon models use their own software based FARE system and the Konica Minolta Dual Scan 4 scanner uses a system in its software. The Konica Minolta 5400, Nikon and Epson use the more sophisticated ICE system (see panel) to remove any imperfections.

The results showed that when it comes to dust and finger marks the ICE system is a huge time saver. Deeper scratches proved more of a challenge, with only the FARE system on the Canon FS4000U attempting to repair them fully. Although it lost some detail in the branches it was a good attempt for a software system.

Which film scanner is right

Your at-a-glance guide to the features, specifications and test comments on each film scanner



Product	Plustek OpticFilm 7200	Konica Minolta DIMAGE Dual Scan 4	Canon Canoscan 9900F	Epson Perfection 4870 Photo	HP Scanjet 8200
Street price	£170	£243	£272	£335	£390
Optical resolution	7200x7200dpi	3200x3200dpi	3200x3200dpi	4800x9600dpi	4800x4800dpi
Optical density	3.4D	4.8D	Not quoted	3.8D	Not quoted
Connection	USB 2.0	USB 2.0	USB 2.0 and Firewire	USB 2.0 and Firewire	USB 2.0
Film formats	35mm	35mm	35mm, T20 and 5x4in	35mm, T20 and 5x4in	35mm
Max. scan size	9720x6480 pixels	4320x2880 pixels	4320x2880 pixels	4328x6511 pixels	4328x6511 pixels
Max. file size	184Mb	36Mb	36Mb	80Mb	80Mb
Preview time	17 seconds	15 seconds	24 seconds	1 minute	10 seconds
Scan time normal	3 minutes 26 seconds	30 seconds	3 minutes 40 seconds	3 minutes 15 seconds	3 minutes 35 seconds
Scan time with dust removal	8 minutes 15 seconds	44 seconds	6 minutes 38 seconds	7 minutes 54 seconds	N/A
Weight/size (WxHxD)	1.35kg/272x119x120mm	1.5kg/145x100x325mm	5.2kg/290x127x509mm	6.7kg/304x134x1478mm	6.6kg/574x121x371mm
Pros	Price, Silverfast software offers plenty of adjustments, good quality scans	Superb speed, even with the dust removal software and good results for prints up to A4 size	Styling and build quality are excellent, medium-format and large-format film scanning options	The best scan quality from a hybrid machine, ability to scan various film formats	Film holder built into the lid so film loading is more positive, very fast previews
Cons	Build quality and operation are basic, slow when using dust removal software at high resolutions	Software interface can be slow to use, build quality could be better	Scan quality from 35mm film lack detail to compete here	35mm scans can't match the best film scanners, high resolution scans are slow	35mm scans lack the clarity of the Epson, large footprint takes up desk space
Contact	Datamind, 0870 770 0848 www.datamind.co.uk	Konica Minolta, 020 8751 6121 www.konicaminolta.co.uk	Canon, 0870 514 3723 www.canon.co.uk	Epson, 0800 220 546 www.epson.co.uk	HP, 0870 010 4320 www.hp.com/uk
Rating	★★★★	★★★★	★★★	★★★★	★★

Connections explained

Choosing how to connect your scanner is almost as important as picking the scanner itself. If you notice that your high-speed scanner keeps back-scanning (stopping, reversing and starting again) this could well be to do with your connection. High-speed scanners need a high-speed connection to prevent back scanning.



USB 1.1 (Universal Serial Bus)

Very easy to set up on Windows 98 or later. USB devices can be hot-swapped, meaning that you don't have to turn your computer off to disconnect and plug another device in. USB 1.1 can transfer data at a rate of 12MBps (mega bits per second) but this is just not fast enough to prevent delay problems when scanning.

USB 2.0

Similar to USB 1.1 but with an improved transfer rate of 480MBps. Some older computers are not USB 2.0 compatible.

for you?



Canon Canoscan FS4000US	Nikon Coolscan LS50ED	Konica Minolta DIMAGE Scan Elite 5400
£429	£469	£527
4000x4000dpi	4000x4000dpi	5400x5400dpi
3.5D	4.2D Practical Photography TESTER'S CHOICE	4.8D
USB 1.1 and SCSI	USB 2.0	USB 2.0 and Firewire
35mm and APS	35mm	35mm
5400x3600 pixels	5400x3600 pixels	7325x4910 pixels
56Mb	56Mb	102Mb
55 seconds	23 seconds	10 seconds
6 minutes 53 seconds	40 seconds	1 minute
8 minutes 35 seconds	1 minute 30 seconds	4 minutes 50 seconds
2.4kg/92x144x368mm	3kg/96x172x315mm	2.5kg/65x165x360mm
High quality scans with plenty of detail, it's well built and at a competitive price	Excellent image quality, easy to use and comprehensive software and speed	Image quality is superb, well built, and stylish
Only USB 1.1, so it's slow unless you use the less user-friendly SCSI interface	Doesn't feel as well built as the opposition, no multiple frame option for mounted slides	Software interface can be slow to use, and it's expensive compared to the Nikon and Canon
Canon, 0870 514 3723 www.canon.co.uk	Nikon, 0870 770 0233 www.nikon.co.uk	Konica Minolta, 020 8751 6121 www.konicaminolta.co.uk
★★★	★★★★★	★★★★

The bottom line

Our verdict on how you should spend your cash...

**Practical Photography
TESTER'S
CHOICE**



Nikon LS50ED: For speed and quality the Nikon is the best.

At the head of the field it's a close fight between the 5400dpi Konica Minolta and the 4000dpi Canon and Nikon. It's the

Nikon that just wins through with a class-leading combination of speed, image quality, features and superb software interface.

The Epson also puts in an excellent performance for a hybrid machine. It can't quite match the dedicated film scanners for quality from 35mm originals, but factor in the lower price, along with the larger format film and print scanning abilities, and it's an amazingly versatile machine.

What the Plustek lacks in sophistication it more than makes up for in value. The results don't live up to the 7200dpi resolution, but they're still impressive. For those on a budget it's a good choice, but if you want the best results from high contrast slides you'd be better off buying one of the more expensive scanners. ■



Epson Perfection 4870: For those with a range of film formats and prints to scan the Epson is the best hybrid scanner.

**Practical Photography
BEST
BUY**

SCSI (Small Computer System Interface)

Pronounced "skuzzy" All operating systems accept SCSI but it can be quite awkward to set up. Data transfer rate of 80MBps.



IEEE 1394 Firewire

Similar to USB in ease to set up and can be hot-swapped but is a little more expensive. Some computers will require a Firewire controller board to be installed. Firewire is becoming the high end standard of scanner connection with its data transfer time of 400MBps.